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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,232	02/11/2004	Norio Takahashi	F97ED0740-DIV3	9905

26071 7590 12/22/2006
JUNICHI MIMURA
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WASHINGTON, DC 20005

EXAMINER

PATEL, ISHWARBHAI B

ART UNIT	PAPER NUMBER
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2841

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/22/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,232	TAKAHASHI, NORIO	
	Examiner	Art Unit	
	Ishwar (I. B.) Patel	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6,7 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6,7 and 13-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/450,504.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Appendix "A"</u> . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 22, 2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 6 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (US Patent No. 5,925,445).

Regarding claim 6, Suzuki, in figure 3, discloses a circuit board for a semiconductor device comprising: a plurality of pads (P1-P4, as marked on figure 3 in

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appendix "A") on which the semiconductor device is to be mounted, said pads being formed on the circuit board (1), and said pads being disposed in a first line (see figure); a plurality of terminals (T1-T4, as marked on figure 3 in appendix "A") formed on a side edge of the circuit board, said terminals being disposed in a second line (see figure), which is in parallel to said first line of said pads (see figure); a resist film (4a, 4b, 4c) covering an area on the circuit board between said pads and said terminals; and a barrier formed between said first line of said pads and said second line of said terminals, said barrier including a plurality of trench (TRC1-TRC2 as marked on figure 3 in appendix "A") disposed along said terminals, and said trenches being formed in said resist film (see figure), wherein the surface of the circuit board is exposed in each trench (insulating board is exposed in the trench, see figure).

Regarding the recitations "for the semiconductor devices", line 3, and "for an external device", line 6, the language "for the semiconductor devices", and for an external device", required that the pads or terminals are to be suitable to be used for the semiconductor devices and for the external device. The pads and terminals of Suzuki can be used for those intended use. Therefore, Suzuki meets the limitation. Further, it has been held that the a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ 2d 1647 (1987).

Regarding claim 7, Suzuki further discloses said trenches are parallel to each other (see figure).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki as applied to claim 6 above.

Regarding claim 13, Suzuki discloses all the features of the claimed invention including the trenches as applied to claim 6 above, but does not disclose a distance between trenches is 1 mm. However, as can be seen from the figure the distance between the trenches will decide the width of the resist between the adjacent pad, which in turn will be decided upon the degree of electrical isolation required between the adjacent pads to avoid short circuit. Further, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the structure of Suzuki with a distance

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between trenches as 1 mm, in order to have the desired degree of isolation between the adjacent pads to avoid short circuit.

Regarding claim 14, the modified structure of Suzuki discloses said terminals are disposed in a certain length, which is shorter than a length of said barrier (see figure).

Regarding claim 15, the modified structure of Suzuki discloses a depth of the barrier equals the thickness of the resist film (see figure).

Regarding claim 16, Suzuki discloses all the features of the claimed invention including the trenches as applied to claim 6 above, but does not disclose each trench had a width of 1 mm. However, as can be seen from the figure the width of the trench will depend upon the size of the pad required as the pads are exposed in the trench. The pad size will depend upon the interconnection structure with the corresponding interconnect to be connected to have reliable interconnection. Further, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the structure of Suzuki with each trench having a width of 1 mm, in order to have desired width of the pad to have a reliable interconnection.

Regarding claim 17, the modified structure of Suzuki discloses said terminals are disposed in a certain length, which is shorter than a length of said barrier (see figure).

Regarding claim 18, the modified structure of Suzuki discloses a depth of the barrier equals the thickness of the resist film (see figure).

Regarding claim 19, the modified structure of Suzuki discloses each trench had a width of 1 mm as applied to claim 16 above.

Regarding claim 20, the modified structure of Suzuki discloses said terminals are disposed in a certain length, which is shorter than a length of said barrier (see figure).

Regarding claim 21, the modified structure of Suzuki discloses a depth of the barrier equals the thickness of the resist film (see figure).

Response to Arguments

3. Applicant's arguments with respect to claims have been considered but are moot in view of the new explanation / new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
December 17, 2006



Ishwar (I. B.) Patel
Primary Examiner

FIG. 3

